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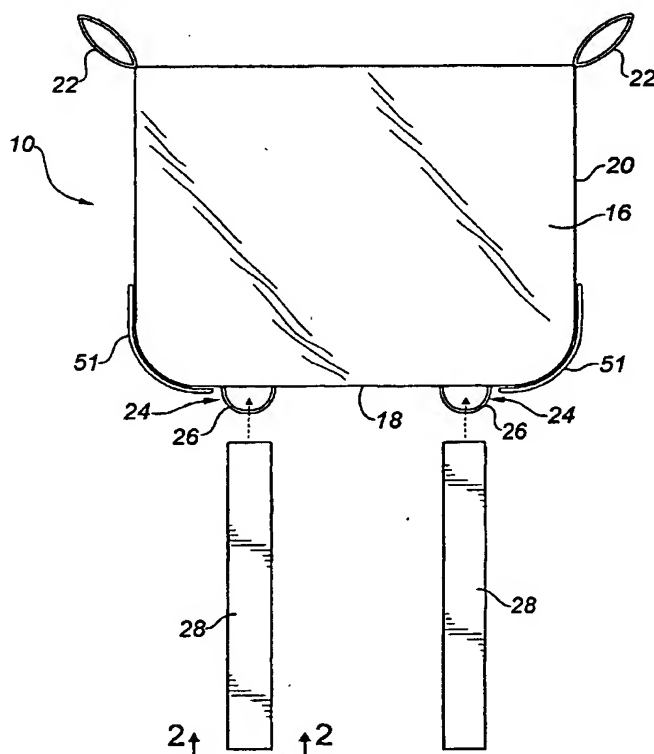
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[Continued on next page]

(54) Title: **BULK BAG**



(57) Abstract: A bulk bag (10) includes a flexible body (16) having a bottom (18). At least one pair of tubular fork tine receiving members (24, 28) are arranged in parallel spaced relation across the bottom (18) of the body (16). Fork tines from a forklift are insertable into the receiving members (24, 28) to lift the body.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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BULK BAGFIELD OF THE INVENTION

5                   The present invention relates to a bulk bag.

BACKGROUND OF THE INVENTION

                  Bulk bags are large bags that are used to transport bulk commodities.  
10   They are currently transported on low portable platforms known as "pallets." The  
use of pallets facilitates the handling of bulk bags with fork lifts. Unfortunately,  
pallets increase the weight and, consequently, the cost of shipping bulk bags. This  
involves both the transportation of full bulk bags from the shipper to the customer,  
and the transportation of empty bulk bags from the customer back to the shipper.

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SUMMARY OF THE INVENTION

                  What is required is a bulk bag that can be readily transported without  
requiring a pallet.

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                  According to the present invention there is provided a bulk bag which  
includes a flexible body having a bottom. At least one pair of tubular fork tine  
receiving members are arranged in parallel spaced relation across the bottom of the  
body. Fork tines from a forklift are insertable into the receiving members to lift the  
25   body.

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                  The bulk bag, as described above, does not need a pallet as provision is  
made for receiving members to accommodate the fork tines of a forklift. This  
enables a forklift to be used to handle the bulk bags. The preferred mode of  
30   construction of the bulk bag involves making the fork tine receiving members in the

form of sleeves that extend across the bottom of the bulk bag into which are inserted rigidifying inserts.

Although beneficial results may be obtained through the use of the bulk bag, as described above, rigidifying inserts can limit the extent to which empty bulk bags may be folded up for transport. Even more beneficial results may, therefore, be obtained when the rigidifying inserts are removable from the sleeves to facilitate transportation of empty bulk bags.

There are various ways in which rigidifying inserts may be maintained within the sleeves and yet, still remain removable to facilitate transportation of empty bulk bags. One way is to provide elastic bands at opposed ends of the sleeves to elastically deform the opposed ends. The elastic bands constrict the opposed ends of the sleeves to preclude the rigidifying inserts from being withdrawn from the sleeves. Another way is to provide a mating clamping component which clamps around the sleeve and onto the rigidifying insert. In this manner the rigidifying insert is clamped in position within the sleeve and cannot be withdrawn until the mating clamping component is removed. Yet another is to have sleeves made from an elastic material, that will stretch to allow entry of the rigidifying inserts and then return to their original form, thereby holding the rigidifying inserts in place.

Although beneficial results may be obtained through the use of the bulk bag, as described above, there is a danger that a fork lift may rupture the bulk bag when attempting to insert fork tines into the fork tine receiving members. Even more beneficial results may, therefore, be obtained when a peripheral reinforcing impact panel is secured to the sidewalls adjacent the bottom of the bulk bag in the vicinity of the at least one pair of tubular fork tine receiving members.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent  
5 from the following description in which reference is made to the appended  
drawings, wherein:

FIGURE 1 is a side elevation view of a bulk bag having fork tine receiving members  
and rigidifying inserts constructed in accordance with the teachings of the present  
10 invention.

FIGURE 2 is an end elevation view of a first embodiment of rigidifying insert.

FIGURE 3 is an end elevation view of the first embodiment of rigidifying insert  
15 illustrated in FIGURE 2 inserted into a sleeve to form a fork tine receiving member.

FIGURE 4 is a side elevation view, in section, of the rigidifying insert illustrated in  
FIGURE 3.

20 FIGURE 5 is an exploded end elevation view of a second embodiment of rigidifying  
insert with mating clamping component.

FIGURE 6 is an exploded end elevation view of the second embodiment of  
rigidifying insert with mating clamping component illustrated in FIGURE 5, and  
25 sleeve.

FIGURE 7 is an end elevation view of the second embodiment of rigidifying insert  
with mating clamping component illustrated in FIGURE 5, clamped onto a sleeve to  
form a fork tine receiving member.

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FIGURE 8 is a bottom plan view of four rigidifying inserts assembled to provide two pairs of fork tine receiving members.

FIGURE 9 is an end elevation view of a third embodiment of rigidifying insert.

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#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The two preferred embodiments of a bulk bag will now be described. A first embodiment generally identified by reference numeral 10 will be described with reference to FIGURES 1 through 4 and 8. A second embodiment generally identified by reference numeral 12 will be described with reference to FIGURES 1 and 5 through 8.

Referring to FIGURE 1, first embodiment of bulk bag 10 includes a flexible body 16 having a bottom 18, a circumferential sidewall 20 and bag handling loops 22. A pair of tubular fork tine receiving members 24 are arranged in parallel spaced relation across bottom 18 of body 16, such that fork tines from a forklift are insertable into receiving members 24 to lift body 16. Fork tine receiving member 24 is a sleeve 26 with a removable rigidifying insert. As will hereinafter be further described, the rigidifying insert can take various forms. Referring to FIGURE 9, the rigidifying insert can be a tubular member 27. It is preferred, however, that the rigidifying insert be in the channel form as will hereinafter be further described in relation to a first embodiment, which is identified in FIGURE 2 by reference numeral 28. A channel form of rigidifying insert takes up less space during transportation.

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Referring to FIGURE 2, first insert 28 has a cross section shape that is substantially an inverted square channel. First insert 28 has a pair of sidewalls 30 in parallel spaced relationship and a top member 32. Top member 32 is rigidly affixed along the length of a top edge 34 of each sidewall 30 at an angle close to 90 degrees. A bottom edge 36 of sidewall 30 is linear and parallel to top edge 34, and is smooth thereby preventing tearing when first insert 28 is inserted into sleeve 26. First insert

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28 is manufactured from a thermoplastic and is preferably of a gauge between 0.110 and 0.300. A height of sidewall 30 is between 2 inches and 5 inches, and a width of top member 32 is between 4 inches and 12 inches; the dimensions of first insert 28 being dependent on the dimensions of sleeve 26, body 16 and a maximum weight to be carried in body 16.

Referring to FIGURE 3, first insert 28 is inserted into sleeve 26 so that top member 32 lies in a substantially coplanar attitude with and supports bottom 18 of body 16. A rectangular fork tine receiving member 24 having a cavity 38 is thereby formed by top member 32, pair of sidewalls 30 and a section 40 of sleeve 26 spanning a space between bottom edges 36 of sidewalls 30. Cavity 38 so formed is ready to receive a fork tine (not shown) from a forklift.

Referring to FIGURE 4, elastic bands 42 are embedded in opposed ends 50 of sleeves 26. First insert 28 is installed by expanding elastic bands 42. When first insert 28 is installed within sleeve 26, elastic bands 42 are positioned between first insert 28, indicated by a dotted line 46, and an opening 48 at one of opposed ends 50 of sleeves 26. Elastic bands 42 elastically deform opposed ends 50, thereby precluding rigidifying first insert 28 from accidentally being withdrawn through opening 48. Referring to FIGURE 9, the same effect can be obtained by having the entire of sleeve 26 made from an elastic material, such as an EVA flex plastic.

Referring to FIGURE 1, it is preferred that a peripheral reinforcing impact panel 51 is secured to said sidewalls 30 in the vicinity of receiving members 24 in order to protect sidewalls 30 adjacent bottom 18 of body 16 against accidental puncture by fork tines of a forklift.

The method of use of first embodiment of bulk bag 10 will now be described with reference to FIGURES 1 through 4. First embodiment of bulk bag 10 is provided in a compactly folded form with first inserts 28 withdrawn from sleeves 26. Body 16 is unfolded and first inserts 28, as illustrated in FIGURE 2, are inserted

into sleeves 26, as illustrated in FIGURE 3 by elastically expanding elastic bands 42. Once insertion has been completed, elastic bands 42 prevent first inserts 28 from accidentally being withdrawn from sleeves 26, as illustrated in FIGURE 4. Once bulk bag 10 has been loaded, fork tines of a forklift are inserted into fork tine receiving channels 24, to lift and move first embodiment of bulk bag 10. Once the load has been discharged from bulk bag 10, inserts 28 are removed from sleeves 26. Body 16 can then be folded in preparation for body 16 and first inserts 28 being stored or transported in a compact form.

Referring again to FIGURE 1, second embodiment of bulk bag 12 includes flexible body 16 substantially similar to said body 16 described above for first embodiment of bulk bag 10. Fork tine receiving member 24 is a sleeve 26 with a second embodiment of insert generally identified by reference numeral 52. Referring to FIGURE 5, second insert 52 is substantially similar to first insert 28, but with the additional feature that sidewall 30 has an angular "J" shaped foot 60 forming a channel 62 external to and along the length of a bottom edge 36 of sidewall 30. A mating component 66 is provided that has a planar base 68 with opposed parallel edges 70. An angular hook shaped member 72 extends along the length of each edge 70, spaced above top face 74 of base 68. Hook member 72 has an engagement lip 78. Referring to FIGURE 6, second insert 52 fits loosely within sleeve 26. When second insert 52 is inserted into sleeve 26, top member 32 lies in a substantially coplanar attitude with and supports bottom 18 of body 16. A rectangular fork tine receiving member 24 having a cavity 38 is thereby formed by top member 32, pair of sidewalls 30 and a spanning section 40 of sleeve 26 spanning a space between bottom edges 36 of sidewalls 30. Cavity 38 so formed is ready to receive a fork tine (not shown) from a forklift. Referring to FIGURE 7, mating component 66 mates with "J" shaped foot 60 on each opposed sidewall 30 of second insert 52. When so mated, engagement lip 78 of hook member 72 is positioned in channel 62 of "J" shaped foot 60. This clamps second insert 52 onto spanning section 40 of sleeve 26, thereby precluding second insert 52 from accidentally being withdrawn through opening 48 of sleeve 26.



The method of use of second embodiment of bulk bag 12 will now be described with reference to FIGURES 1 and 5 through 7. Second embodiment of bulk bag 12 is provided in a compactly folded form with second inserts 52 withdrawn from sleeves 26. Body 16 is unfolded and second inserts 52 are inserted into sleeves 26, as illustrated in FIGURE 6. Engagement lip 78 of hook member 72 of mating component 66 is then mated with channel 62 to clamp second insert 52 onto spanning section 40 of sleeve 26. Body 16 is filled with a load and fork tines of a forklift are inserted into fork tine receiving channels 24 to lift and move bulk bag 10. When load has been discharged from body 16 mating component 66 is removed to enable second inserts 52 are removed from sleeves 26. Body 16 can then be folded in preparation for bulk bag and second inserts 52 being stored or transported in a compact form.

Referring to FIGURE 8, two pairs of tubular fork tine receiving members 24 are used when there is a need to be able to lift bulk bag 10 from four sides, as opposed to two sides. A first pair of the tubular fork tine receiving members 24a crosses substantially perpendicularly a second pair of tubular fork tine receiving members 24b. A forklift can then approach a loaded bulk bag from any of four sides and insert fork tines into one of pair of fork tine receiving members 24a or pair of fork tine receiving members 24b.

In order to accommodate two pairs of receiving members 24, two pairs of intersecting or crossing sleeves 26 are preferably provided across the bottom 18 of the body 16, and two pairs of intersecting or crossing rigidifying inserts 28 are preferably provided for insertion in the sleeves 26. This can be accomplished by providing communication between the sleeves 26 at the point of their intersection and by providing notches in the rigidifying inserts 28 at their points of intersection so that they can be assembled in a single plane and still permit fork tines to access either pair of receiving members 24a or 24b. Alternatively, the two pairs of receiving members 24a and 24b could be located in different planes along the bottom 18 of the

body 16, thus eliminating the need for intersecting or crossing sleeves 26 and rigidifying inserts 28.

5 It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

- 5 1. A bulk bag, comprising:  
a flexible body having a bottom and sidewalls; and  
at least one pair of tubular fork tine receiving members;  
wherein the receiving members are arranged in substantially parallel spaced relation  
across the bottom of the body such that fork tines from a forklift are insertable into  
10 the receiving members to lift the body.
2. The bulk bag as defined in claim 1, wherein the fork tine receiving  
members are comprised of sleeves and associated rigidifying inserts.
- 15 3. The bulk bag as defined in claim 2, wherein the rigidifying inserts are  
removably insertable in the sleeves.
4. The bulk bag as defined in Claim 3, further comprising elastic bands  
positioned at opposed ends of the sleeves to elastically deform the opposed ends,  
20 thereby precluding the rigidifying inserts from being withdrawn from the sleeves.
5. The bulk bag as defined in Claim 3, wherein each of the rigidifying  
inserts have a mating component which clamps around the sleeve and onto the  
rigidifying insert, thereby precluding the rigidifying inserts from being withdrawn  
25 from the sleeves.
6. The bulk bag as defined in Claim 3, wherein the sleeves are made from  
a material with sufficient elasticity to stretch to receive the rigidifying inserts and  
then contract to inhibit the rigidifying inserts from being withdrawn from the  
30 sleeves.

7. The bulk bag as defined in Claim 6, wherein the sleeves are comprised of a flex plastic.

8. The bulk bag as defined in Claim 1, further comprising a peripheral reinforcing impact panel secured to the sidewalls adjacent the bottom in the vicinity of the at least one pair of tubular fork tine receiving members.

9. The bulk bag as defined in Claim 1, wherein the bulk bag comprises two pairs of tubular fork tine receiving members, one of the two pairs of tubular fork tine receiving members crossing substantially perpendicularly another of the two pairs of tubular fork tine receiving members.

10. The bulk bag as defined in Claim 2, wherein the rigidifying inserts are comprised of tubular members.

11. The bulk bag as defined in Claim 2, wherein the rigidifying inserts are comprised of channel-form members.

12. A bulk bag, comprising:  
a flexible body having a bottom and sidewalls;  
at least one pair of tubular fork tine receiving members arranged in parallel spaced relation across the bottom of the body, such that fork tines from a forklift are insertable into the receiving members to lift the body, the fork tine receiving members being comprised of sleeves with removable rigidifying inserts; and  
elastic bands positioned at opposed ends of the sleeves to elastically deform the opposed ends, thereby precluding the rigidifying inserts from being withdrawn from the sleeves.

13. The bulk bag as defined in Claim 12, further comprising a peripheral reinforcing impact panel secured to the sidewalls adjacent the bottom in the vicinity of the at least one pair of tubular fork tine receiving members.

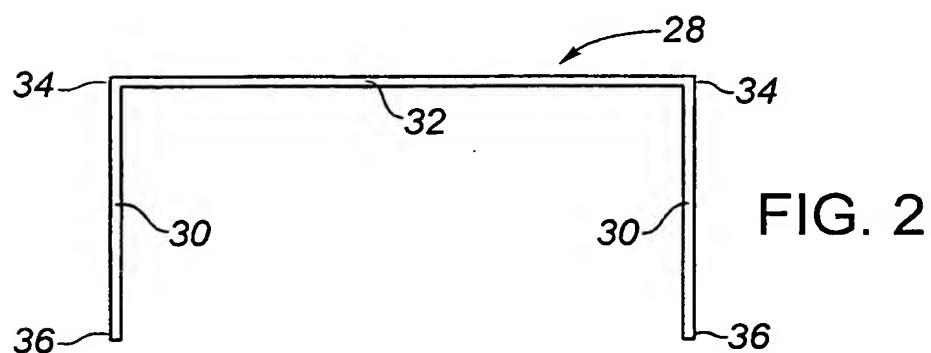
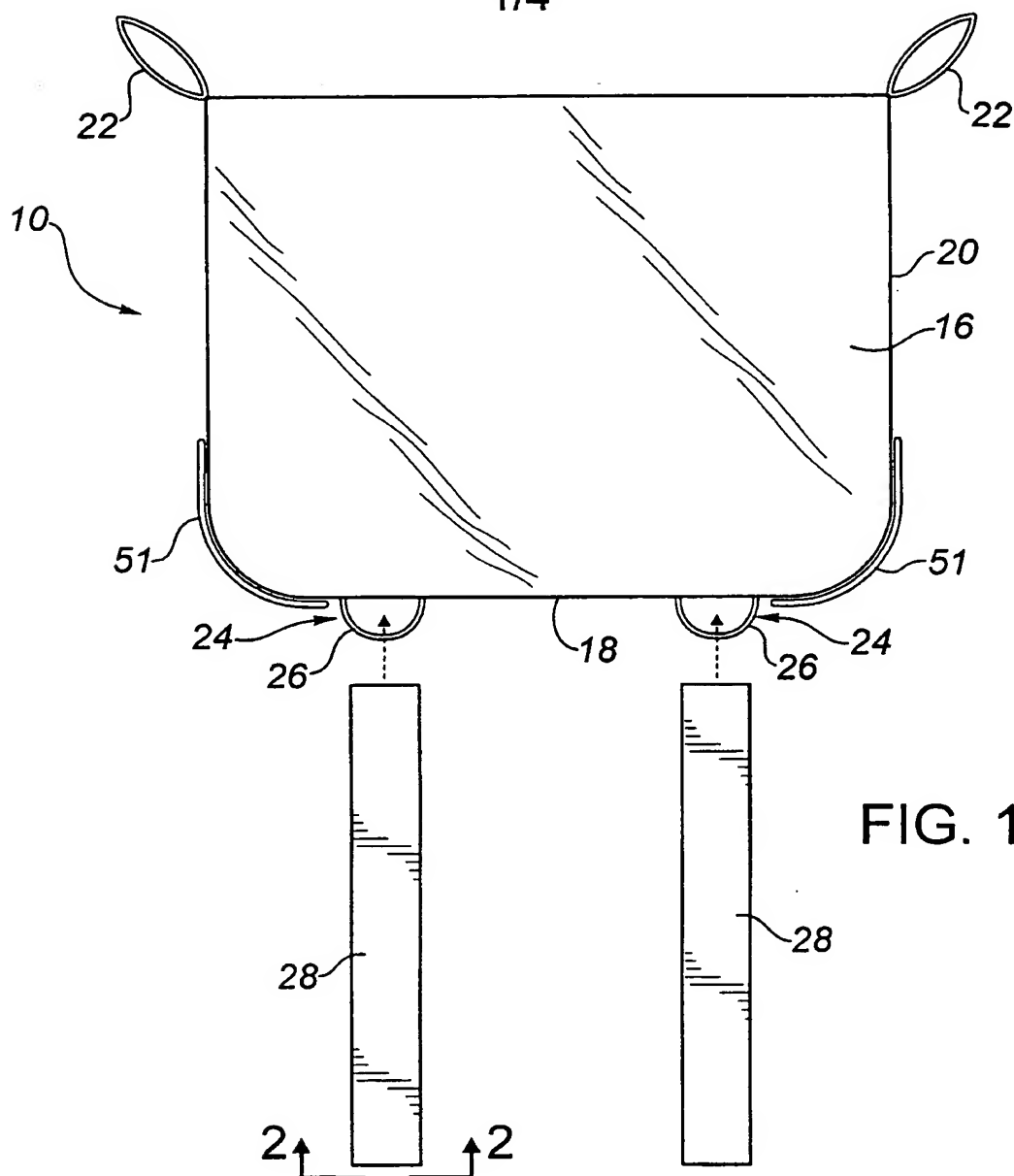
14. The bulk bag as defined in Claim 12, wherein the bulk bag comprises two pairs of tubular fork tine receiving members, one of the two pairs of tubular fork tine receiving members crossing substantially perpendicularly another of the two pairs of tubular fork tine receiving members.

15. A bulk bag, comprising:  
a flexible body having a bottom and sidewalls; and  
at least one pair of tubular fork tine receiving members;  
arranged in parallel spaced relation across the bottom of the body, such that fork tines from a forklift are insertable into the receiving members to lift the body, the fork tine receiving members being sleeves with removable rigidifying inserts, the rigidifying inserts having a mating component which clamps onto the sleeve, thereby precluding the rigidifying inserts from being withdrawn from the sleeves.

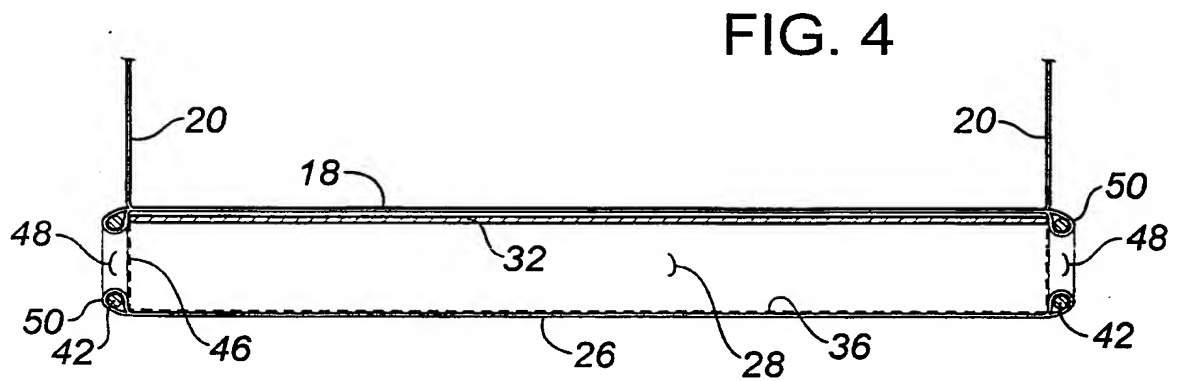
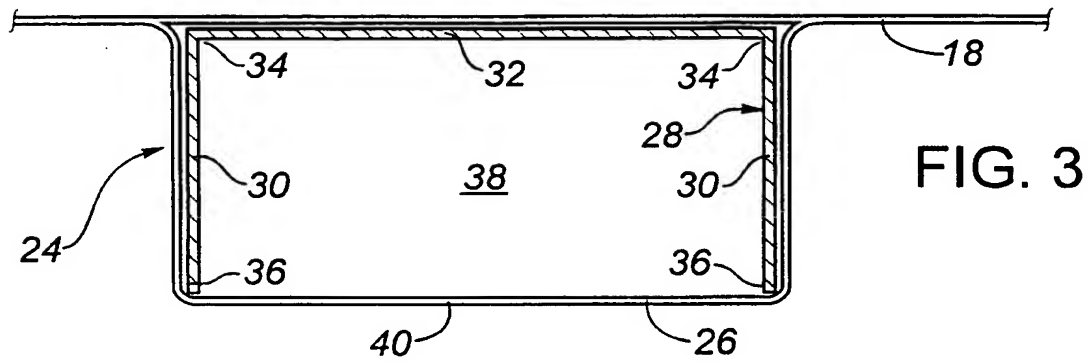
16. The bulk bag as defined in Claim 15, wherein a peripheral reinforcing impact panel is secured to the sidewalls adjacent the bottom in the vicinity of the at least one pair of tubular fork tine receiving members.

17. The bulk bag as defined in Claim 15, wherein the bulk bag comprises two pairs of tubular fork tine receiving members, one of the two pairs of tubular fork tine receiving members crossing substantially perpendicularly another of the two pairs of tubular fork tine receiving members.

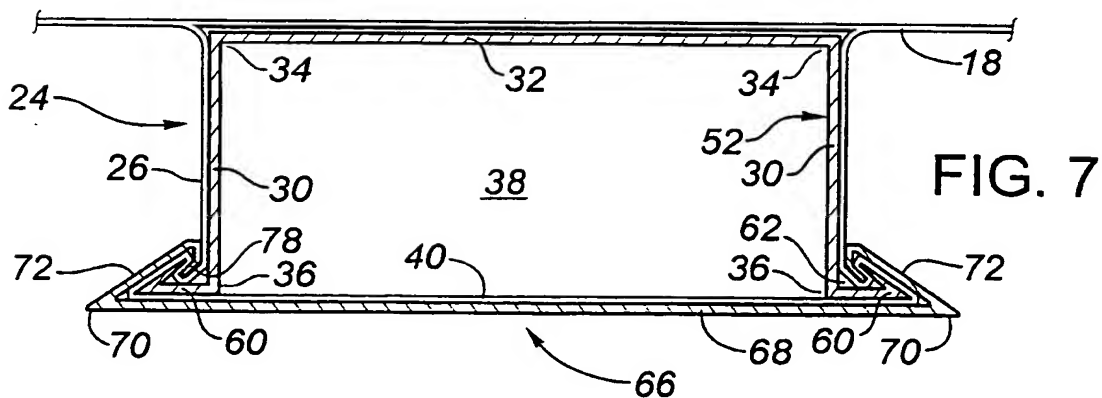
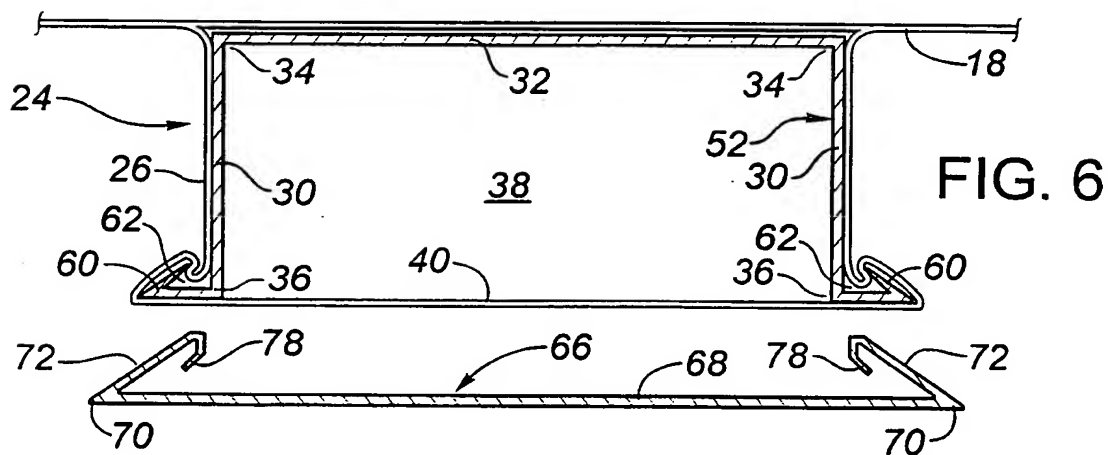
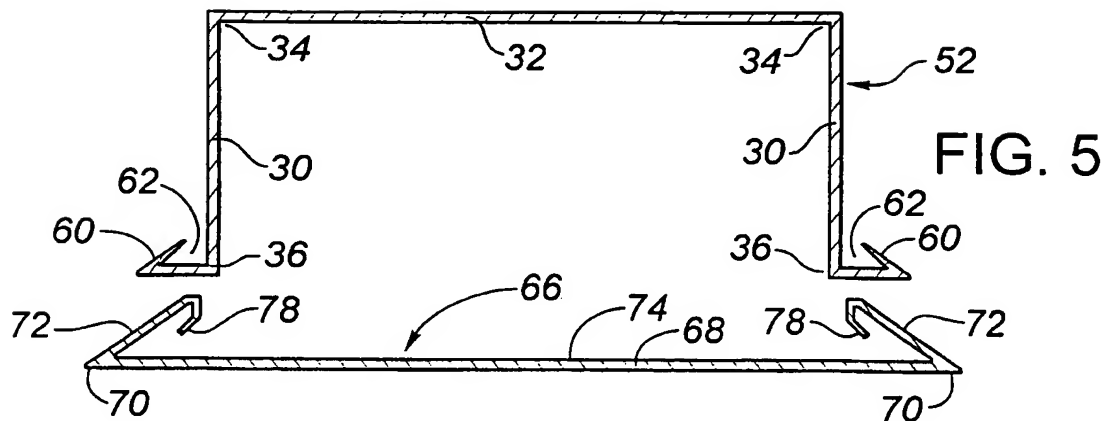
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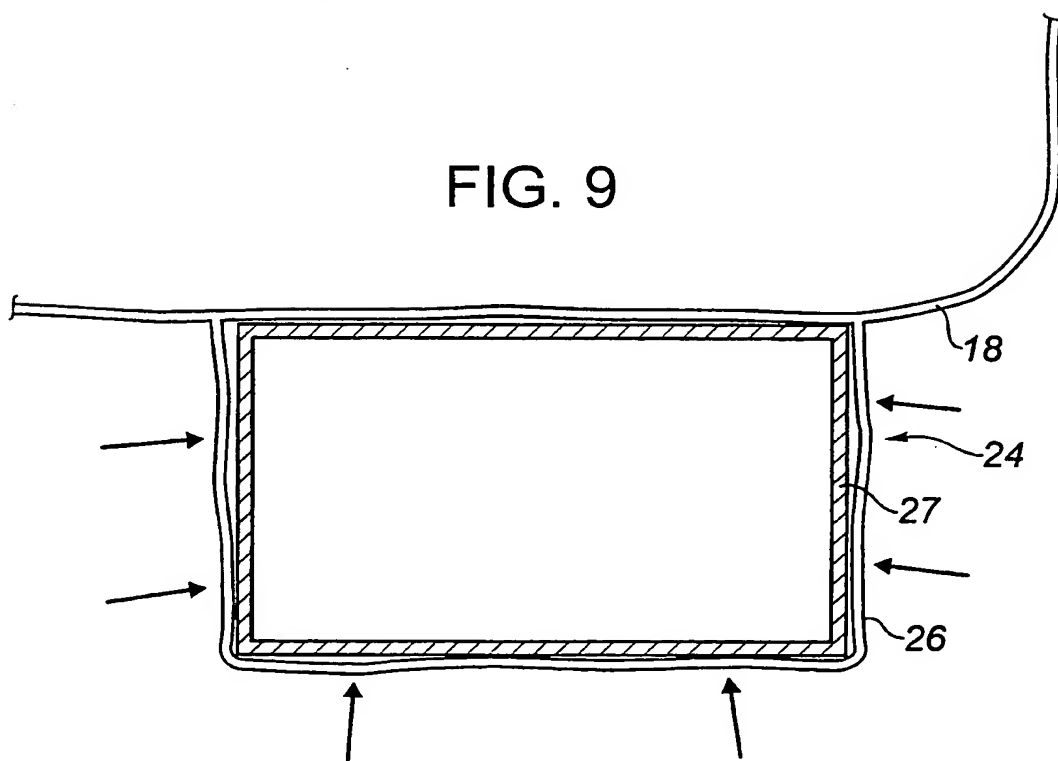
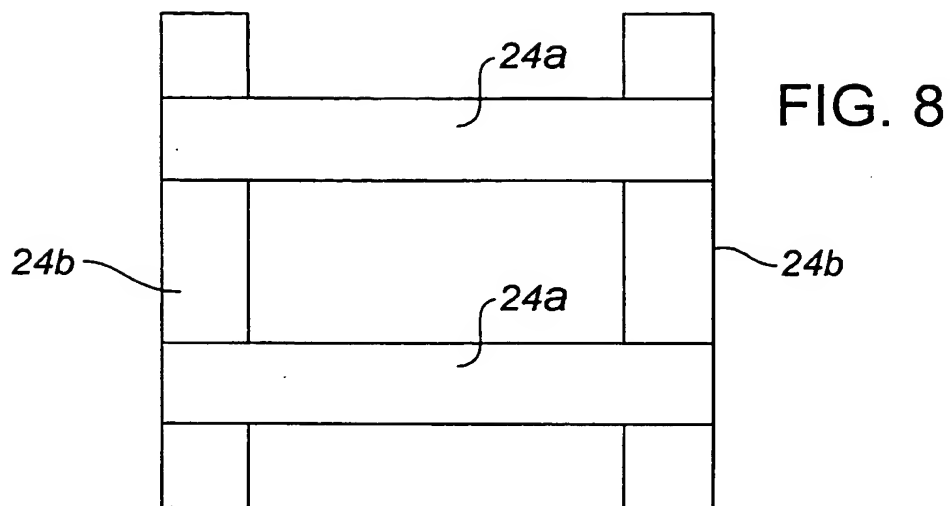


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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00432

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65D88/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	GB 2 161 452 A (DORTON PACKAGING LTD; HUMBER FABRICS LTD) 15 January 1986 (1986-01-15) the whole document	1-4, 6, 7, 11, 12
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

### \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00432

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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